8-04 CURBS, GUTTERS, AND SPILLWAYS

8-04.1 Description

This Work consists of the construction of cement concrete curbs, curbs and gutters, gutters, spillways, hot mix asphalt curbs, gutters, spillways, and metal spillways, of the kind and design specified, at the locations shown in the Plans or where designated by the Engineer in accordance with these Specifications and in conformity to the lines and grades as staked.

8-04.2 Materials

Materials shall meet the requirements of the following sections:

Portland Cement	9-01
Aggregates	9-03
Premolded Joint Filler	9-04.1
Drain Pipe	9-05.1
Steel Culvert Pipe and Pipe Arch	9-05.4
Aluminum Culvert Pipe	9-05.5
Structural Steel and Related Materials	9-06
Reinforcing Steel	9-07
Hand Placed Riprap	9-13.2

Hot Mix Asphalt (HMA) curbs, gutters, and spillways shall be constructed of an HMA mix that will have a dense, uniform surface and will fully retain its shape, grade, and line after placement. The mix components shall meet applicable requirements for asphalt concrete specified in Section 5-04 and shall be approved by the Engineer.

8-04.3 Construction Requirements

8-04.3(1) Cement Concrete Curbs, Gutters, and Spillways

Cement concrete curb, curb and gutter, gutter, and spillway shall be constructed with air entrained concrete Class 3000 conforming to the requirement of Section 6-02 except at driveway entrances. Cement concrete curb or curb and gutter along the full width of a driveway entrance shall be constructed with air entrained concrete Class 4000 conforming to the requirements of Section 6-02.

The foundation for curbs, gutters, and spillways shall be thoroughly compacted and required side forms shall rest throughout their length on firm ground. Side forms for straight sections shall be full depth of the curb. They shall be either metal of suitable gage for the Work or surfaced “construction” grade lumber not less than 2-inches (commercial) in thickness. Forms used more than 1 time shall be thoroughly cleaned and any forms that have become worn, splintered, or warped shall not be used again.

The foundation shall be watered thoroughly before the concrete is placed, and the concrete shall be well tamped and spaded or vibrated in the forms. The exposed surfaces shall be finished full width with a trowel and edger. Within 24-hours after the concrete is placed, the forms of the Roadway face of curbs shall be removed, and the concrete treated with a float finish. The top and face of the curb shall receive a light brush finish, and the top of the gutter shall receive a broom finish.

Expansion joints in the curb or curb and gutter shall be spaced at 15-foot intervals, the beginning and ends of curb returns, drainage Structures, bridges, and cold joints with existing curbs and gutters. The expansion joint shall be filled to full cross-section with

3/8-inch premolded joint filler. When curb or curb and gutter is placed adjacent to Portland Cement Concrete Pavement, a 1/4-inch thick, 6-inch deep premolded joint filler shall be installed between the 2 vertical surfaces to prevent cracking. When noted in the Plans, the Contractor shall install the catch basin gutter pan at drainage Structures abutting the curb and gutter.

The concrete shall be cured for 72-hours by 1 of the methods specified for cement concrete pavement in Section 5-05.

At the option of the Contractor, the curb and gutter may be constructed using approved slip-form equipment. The curb and gutter shall be constructed to the same requirements as the cast-in-place curb and gutter.

A water-reducing admixture conforming to the requirements of Section 9-26 may be used provided the finished curb and gutter shall retain its line and shape.

8-04.3(1)A Extruded Cement Concrete Curb

Extruded cement concrete curb shall be placed, shaped, and compacted true to line and grade with an approved extrusion machine. The extrusion machine shall be capable of shaping and thoroughly compacting the concrete to the required cross section.

The pavement shall be dry and cleaned of loose and deleterious material prior to curb placement. Cement concrete curbs shall be anchored to the existing pavement by placing steel tie bars 1-foot on each side of every joint.

Tie bars shall meet the dimensions shown in the Standard Plans.

Joints in the curb shall be spaced at 10-foot intervals. Joints shall be cut vertically and to the depth shown in the Standard Plans.

All other requirements for cement curb and cement concrete curb and gutter shall apply to extruded cement concrete curb.

The Contractor may substitute extruded cement concrete curb for extruded HMA concrete curb upon receiving written permission from the Engineer. There will be no change in unit Contract price if this substitution is allowed.

8-04.3(2) Extruded Asphalt Concrete Curbs, and Gutters

Asphalt concrete curbs, gutters, and spillways shall be constructed of Commercial HMA as specified in Section 5-04. The HMA will have a dense, uniform surface and will fully retain it's shape, grade, and line after placement. Just prior to placing the curb, a tack coat of asphalt shall be applied to the existing pavement surface at the rate ordered by the Engineer.

Set forms will not be required for forming gutter if slip-form equipment of a type approved by the Engineer is used. Gutter shall be shaped and compacted to the required line, grade, and cross section. Connections to any type of outlet shall be constructed so as to form a watertight joint.

8-04.3(3) Vacant

8-04.3(4) Metal Spillways

Round metal spillways shall be plain metal drain pipe 8-inch diameter and when specified in the Contract, the joints shall be sealed with rubber gaskets conforming to the requirements of Section 9-04.4(4). Half round metal spillways shall be half round metal culvert pipe of the size, kind, and thickness shown in the Plans.

In the construction of metal spillways, sufficient bands, elbows, and joints shall be furnished and placed by the Contractor to permit the construction and connection of the spillways as indicated in the Plans so as to carry the drainage from gutters to the inlets and spillways without percolation of the water under and around the Structure.

Spillway pipe shall be laid in a trench in the embankment slope and shall not be placed until after the embankment slopes have been completed and dressed to the lines prescribed by the Engineer. The lower end of the pipe spillway shall be adequately protected and supported by hand placed riprap, concrete, or by other means as may be shown in the Plans. After the spillway pipe has been placed and connected, the trench shall be backfilled, thoroughly compacted, and the embankment slopes restored to their original condition.

8-04.3(5) Spillways at Bridge Ends

Where spillways are required to be constructed at bridge ends, they shall be constructed in the embankment slopes as described above and arranged so that they will connect to the bridge drains. The pipe shall be plain metal drain pipe 8-inch diameter and the joints shall be sealed with rubber gaskets conforming to the requirements of Section 9-04.4(4).

8-04.4 Measurement

All curbs, gutters, and spillways will be measured by the linear foot along the line and slope of the completed curbs, gutters, or spillways, including bends. Measurement of cement concrete curb and cement concrete curb and gutter, when constructed across driveways or sidewalk ramps, will include the width of the driveway or sidewalk ramp.

Except for metal spillways, excavation for these Structures shall be incidental to the items involved. Structure excavation required for the installation of metal spillways will be measured in accordance with the provisions of Section 2-09.

Hand placed riprap will be measured in accordance with Section 8-15.4.

8-04.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Cement Conc. Traffic Curb and Gutter", per linear foot.

"Cement Conc. Traffic Curb", per linear foot.

"Mountable Cement Conc. Traffic Curb", per linear foot.

"Dual-Faced Cement Conc. Traffic Curb and Gutter", per linear foot.

"Dual-Faced Cement Conc. Traffic Curb", per linear foot.

"Cement Conc. Pedestrian Curb", per linear foot.

"Roundabout Truck Apron Inner Cement Conc. Curb", per linear foot.

"Roundabout Truck Apron Outer Cem. Conc. Curb and Gutter", per linear foot.

"Extruded Curb", per linear foot.

"Cement Conc. Gutter", per linear foot.

"Cement Conc. Spillway", per linear foot.

"Asphalt Conc. Gutter", per linear foot.

"Asphalt Conc. Spillway", per linear foot.

"Drain Pipe ___ In. Diam.", per linear foot.

"Half Round Plain St. Culv. Pipe ___ In. Th. ___ In. Diam.", per linear foot.

"Half Round Tr. 1 St. Culv. Pipe ___ In. Th. ___ In. Diam.", per linear foot.

"Half Round Plain Al. Culv. Pipe ___ In. Th. ___ In. Diam.", per linear foot.

"Half Round Tr. 1 Al. Culv. Pipe ___ In. Th. ___ In. Diam.", per linear foot.

"Hand Placed Riprap", per cubic yard.

Hand placed riprap will be paid for as provided in Section 8-15.5.

When catch basin gutter pans are required in the Plans, all costs for providing the widened area of gutter pan shall be included in the curb and gutter Bid item.